

[illegible]

5 an RF input/output stage for input of an RF signal from an antenna during
a receive mode and for output of an RF signal to an antenna during a transmit mode:

a direct digital synthesis and control (DDS) circuit including a
10 programmable oscillator;

15 a quadrature component polyphase filter for filtering said second RF signal under the control of said DDS circuit to generate a second output bandlimited signal; and

20 2. The RF transceiver of Claim 1, wherein said in-phase component polyphase filter comprises a first switched capacitor filter, and wherein said quadrature component polyphase filter comprises a second switched capacitor filter.

4. The RF transceiver of Claim 1, further comprising a third polyphase filter
30 coupled to said baseband processor and said DDS for modulating digital data bits in a
transmit mode to generate an output RF signal for coupling to an antenna.

5. The RF transceiver of Claim 4, wherein said third polyphase filter comprises a third switched capacitor filter.

5 6. A frequency agile variable bandwidth radio frequency (RF) transceiver comprising:
an RF input/output stage for input of an RF signal from an antenna during a receive mode and for output of an RF signal to an antenna during a transmit mode:
an RF splitter for splitting the input RF input signal into a first RF signal
10 and a second RF signal:
a direct digital synthesis and control (DDS) circuit including a programmable oscillator;
an in-phase component polyphase switched capacitor filter for filtering and bandlimiting said first RF signal under the control of said DDS circuit to generate a
15 first output bandlimited signal;
a quadrature component polyphase switched capacitor filter for filtering said second RF signal under the control of said DDS circuit to generate a second output bandlimited signal;
a mixer coupled to the output of each said switched capacitor filter and
20 operative to tune the output of said respective filter; and
a baseband processor for demodulating said first and second output bandlimited and tuned signals to generate an output digital signal comprising a plurality of data bits.

25 7. A frequency agile variable bandwidth radio frequency (RF) transceiver comprising:
an RF input/output stage for input of an RF signal from an antenna during a receive mode and for output of an RF signal to an antenna during a transmit mode:
an RF splitter for splitting the input RF input signal into a first RF signal
30 and a second RF signal:

a direct digital synthesis and control (DDS) circuit including a programmable oscillator;

5 a first sigma-delta modulator coupled to said first RF signal to bandlimit, translate, and sample said first RF signal under the control of said DDS circuit to generate a first output bandlimited signal;

a second sigma-delta modulator coupled to said second RF signal to bandlimit, translate, and sample said second RF signal under the control of said DDS circuit to generate a second output bandlimited signal; and

10 a baseband processor for demodulating said first and second output bandlimited and tuned signals to generate an output digital signal comprising a plurality of data bits.

8. A method for generating a frequency agile variable bandwidth radio frequency (RF) transceiver comprising the steps of:

15 detecting an RF signal from an antenna during a receive mode and for output of an RF signal to an antenna during a transmit mode:

splitting the input RF input signal into a first RF signal and a second RF signal:

20 filtering and bandlimiting said first RF signal using an in-phase component polyphase filter to generate a first output bandlimited and tuned signal; filtering said second RF signal using a quadrature component polyphase filter to generate a second output bandlimited and tuned signal; and

demodulating said first and second output bandlimited and tuned signals to generate an output digital signal comprising a plurality of data bits.

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